

## CLAIMS

We claim:

1        1. An apparatus for wrapping a napkin around one or more  
2 utensils, comprising:

3        a generally rectangular hollow housing having, an output  
4 opening disposed on said housing, a utensil input and a napkin  
5 input;

6        a support frame, positioned inside of said housing, having  
7 an assembly of vertically oriented beams and horizontally  
8 oriented support rails;

9        a napkin lifting station for receiving and supporting a  
10 stack of napkins, the napkins being placed onto said lifting  
11 station through said napkin input;

12       a napkin wrapping station having a plurality of conveyor  
13 belts for wrapping a napkin around a predetermined amount of  
14 utensils;

15       a napkin transfer station for individually transferring  
16 napkins from said napkin lifting station to said napkin wrapping  
17 station;

18 a utensil transfer station for simultaneously placing a  
19 plurality of utensils onto an individual napkin while the napkin  
20 is positioned on the napkin wrapping station; and

21 a napkin folding station for folding over corners of a  
22 napkin prior to being wrapped by said wrapping station;

23 whereby said napkin lifting station, napkin wrapping  
24 station, napkin transfer station, napkin folding station and  
25 utensil transfer station are each disposed on said support  
26 frame;

27 whereby a predetermined amount of utensils are  
28 automatically wrapped in a napkin for use as a place setting  
29 without the need of human contact.

1 2. The apparatus according to claim 1 wherein said napkin  
2 lifting station comprises:

3 a platform having a flat top surface;

4 a plurality of platform supports; and

5       a platform lift for incrementally lifting said platform  
6 after a predetermined number of napkins are removed from the  
7 napkin lifting station.

1       3. The apparatus according to claim 1 wherein said napkin  
2 wrapping station comprises:

3       a pair of sidewalls;

4       a horizontally oriented, elongated output conveyor belt  
5 disposed between the pair of sidewalls;

6       a pair of counter-rotating napkin wrapping belts;

7       a wrapping carriage having a plurality of winding rollers;

8       a wrapping carriage shifter assembly; and

9       a plurality of actuators for powering said napkin wrapping  
10 station.

1       4. The apparatus according to claim 1 wherein said napkin  
2 transfer station comprises:

3       a base plate having a flat bottom surface and an area  
4 generally equivalent to the size of a napkin;

5 a plurality of suction devices, for releasably engaging the  
6 napkins, disposed along the bottom surface of the base plate;  
7 a height adapter for raising and lowering said base plate;  
8 a pair of guide rails; and  
9 a shifter assembly for repositioning said base plate along  
10 the guide rails.

1 5. The apparatus according to claim 1 wherein said utensil  
2 transfer station comprises:

3 a plurality of cartridges for sortingly storing stacks of a  
4 plurality of types of utensils;

5 a plurality of lifters for lifting each of the stacks of  
6 utensils;

7 a plurality of utensils grippers for removing individual  
8 utensils from the cartridges;

9 a shifter assembly for lifting and transporting the  
10 utensils from the cartridges to the napkin; and

11 a bracket for mounting the said utensil transfer station to  
12 said support frame.

1 6. The apparatus according to claim 5 wherein said utensil  
2 transfer station further comprises a feed conveyor belt for

3 receiving the utensils from the utensil grippers and  
4 subsequently transporting the utensils to the napkins.

1 7. The apparatus according to claim 5 wherein each of said  
2 cartridges contains a different type of utensil and the number  
3 of cartridges used may vary depending on the number of different  
4 utensils used.

1 8. The apparatus according to claim 5 wherein said utensil  
2 grippers comprise a pneumatic gripper having a pair of fingers  
3 for releasably engaging the sides of the utensils.

1 9. The apparatus according to claim 1 wherein said napkin  
2 folding station comprises:

3 a folding arm having at least one suction device disposed  
4 on its bottom surface for releasably engaging the napkin;

5 a vacuum lift for raising and lowering the folding arm; and

6 a shifter assembly for allowing the folding arm to  
7 manipulate the napkin.

1 10. The apparatus according to claim 3 wherein said output  
2 opening is aligned with said output conveyor belt so that the  
3 wrapped utensils will exit out of the apparatus along said  
4 output conveyor belt and through said output opening.

1        11.     The apparatus according to claim 5 wherein said  
2     utensil input comprises a door disposed on said housing and  
3     allows the utensils to be placed in said cartridges of said  
4     utensil transfer station.

1        12.     The apparatus according to claim 2 wherein said napkin  
2     input comprises a door disposed on said housing and aligned with  
3     said napkin lifting station to allow the napkins to be placed on  
4     said napkin lifting station.

1        13.     An apparatus for wrapping a napkin around one or more  
2     utensils comprising:

3        a generally rectangular shaped, hollow housing having an  
4     output opening, a utensil input access door and a napkin input  
5     access door;

6        a support frame, positioned inside of said housing, having  
7     an assembly of vertically disposed beams and horizontally  
8     disposed support rails;

9        a napkin lifting station for receiving and supporting a  
10    stack of napkins, the napkins being placed onto said lifting  
11    station through said napkin input access door, said lifting  
12    station having a platform, with a flat top, a plurality of  
13    supports and a platform lift for incrementally lifting said

14 platform after a predetermined amount of napkins are removed  
15 from the stack;

16 a napkin wrapping station for wrapping a napkin around a  
17 predetermined amount of utensils, having a pair of sidewalls, an  
18 output conveyor belt disposed between said pair of sidewalls, a  
19 pair of counter-rotating napkin wrapping belts, a wrapping  
20 carriage having a plurality of winding rollers, a wrapping  
21 carriage shifter assembly and a plurality of actuators for  
22 operating said napkin wrapping station;

23 a napkin transfer station for individually transferring  
24 napkins from said napkin lifting station to said napkin wrapping  
25 station, having a base plate with a flat bottom surface, a  
26 plurality of suction devices disposed on the bottom surface of  
27 the base plate, a height adapter for raising and lowering the  
28 base plate, a pair of guide rails and a shifter assembly for  
29 repositioning the base plate along the guide rails;

30 a utensil transfer station for simultaneously placing a  
31 plurality of types of utensils onto an individual napkin while  
32 the napkin is positioned on said napkin wrapping station, said  
33 utensil transfer station having a plurality of cartridges for  
34 sortingly storing a plurality of types of utensils, a plurality  
35 of lifters for lifting each of the stacks of utensil out of the  
36 cartridges, a plurality of utensils grippers for removing  
37 individual utensils from the cartridges, a utensil shifter

38 assembly for lifting and transporting the utensils onto the  
39 napkins and a bracket for mounting said utensil transfer station  
40 to said support frame; and

41 a napkin folding station for folding over corners of a  
42 napkin prior to being wrapped by said wrapping station, having  
43 a folding arm with a suction device disposed on its bottom  
44 surface for releasably engaging the napkin and a shifting  
45 assembly for allowing the folding arm to manipulate the napkin;

46 whereby said napkin lifting station, napkin wrapping  
47 station, napkin transfer station, napkin folding station and  
48 utensil transfer station are each disposed on said support  
49 frame;

50 whereby a predetermined amount of utensils are  
51 automatically wrapped in a napkin for use as a place setting  
52 without the need of human contact.

1 14. A method of wrapping a napkin around one or more  
2 utensils, said method comprising the steps of:

3 positioning a stack of napkins on a napkin lifting station;

4 individually transferring napkins from said lifting station  
5 to a napkin wrapping station;

6       transferring a plurality of utensils from a plurality of  
7       utensil storage cartridges to said napkin wrapping station and  
8       positioning the utensils on the napkin;  
9       folding two opposing corners of the napkin over itself; and  
10       wrapping the napkin around the utensils.

1       15.   The method according to claim 14 wherein said napkin  
2       transfer step includes releasably engaging the napkins  
3       individually with a napkin transfer plate having a plurality of  
4       suction devices disposed on its bottom surface and then lifting  
5       and carrying each napkin to said napkin wrapping station.

1       16.   The method according to claim 14 wherein said utensils  
2       transfer step includes gripping an individual utensil from each  
3       of said utensil storage cartridges and transporting them to a  
4       utensil feeding conveyor belt that transfers the utensils onto a  
5       napkin positioned on the napkin wrapping station.

1       17.   The method according to claim 14 wherein said wrapping  
2       step includes placing the napkin across a gap between adjacent,  
3       counter-rotating wrapping belts that feed the napkin onto a pair  
4       of winding rollers that roll the napkin around the utensils and  
5       then once the napkin is rolled, lowering the winding rollers so

6 the napkin falls onto an exit conveyor and exits said napkin  
7 wrapping station.

1 18. The method according to claim 17, further including  
2 the step of transporting the wrapped napkins along said exit  
3 conveyor through an output opening.